Errata for "Discriminator optimal transport", NeurIPS2019

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The equation (16) in Theorem 1,

$$T(\boldsymbol{y}) = \arg\min_{\boldsymbol{x}} \left\{ ||\boldsymbol{x} - \boldsymbol{y}||_2 - D^*(\boldsymbol{x}) \right\}, \tag{16}$$

should be replaced by

$$T(\boldsymbol{y}) \in \arg\min_{\boldsymbol{x}} \left\{ ||\boldsymbol{x} - \boldsymbol{y}||_2 - D^*(\boldsymbol{x}) \right\}. \tag{16'}$$

Correspondingly, "=" in eq. (19), eq. (22), eq.(23), eq.(25), should be also replaced by "∈". In this statement, we thought that assuming the existence of the Monge map T was sufficient to conclude (16), i.e. uniqueness of argmin, but it was not. We updated arXiv version correspondingly.

The proposed method itself is just trying to minimize the right hand side and there is no practical problem. But to explain potential problem, we added the **Note added** section in **5 Conclusion** of the updated arXiv version: *"Although our proposed gradient-based algorithms work well, it is not evident whether the gradient update can find the exact transport map T. Gradient descent of the objective function on the right hand side of (16) is expected to provide a minimum of the objective, that includes $T(\boldsymbol{y})$, if it exists, but many other points represented by $\{t\boldsymbol{y} + (1 - t)T(\boldsymbol{y})|t \in [0, 1]\}$ are also included in the set of minima as pointed out in [1]. If we could remove these unnecessary points, it would be possible to make better update."*

References

[1] Yuxuan Song, Qiwei Ye, Minkai Xu, and Tie-Yan Liu. Discriminator contrastive divergence: Semi-amortized generative modeling by exploring energy of the discriminator. *CoRR*, abs/2004.01704, 2020.